

#4

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION EXAMINING OPERATIONS

Applicant: Dipankar SEN

Group Art Unit:

Serial No: 10/507,387

Examiner:

Filed : 3 November 2003

Title : DNA AND RNA CONFORMATIONAL SWITCHES AS SENSITIVE  
ELECTRONIC SENSORS OF ANALYTES

**INFORMATION DISCLOSURE STATEMENT  
IN ACCORDANCE WITH 37 CFR § 1.97**

1600 ODS Tower  
601 S.W. Second Avenue  
Portland, OR 97204-3157

May 5, 2005

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Applicant submits herewith a copy of respective  
patents of which he is aware and which he desires to have  
considered by the Patent Office in accordance with 37 CFR  
§ 1.97.

In accordance with 37 CFR § 1.97(h), the filing of  
this Information Disclosure Statement will not be regarded as  
an admission that any references or combination of references  
referred to herein is, or is considered to be, material to  
patentability under 37 CFR § 1.56(b) unless specifically  
designated as such.

A listing of the enclosed references is enclosed herewith on one or more pages of Form PTO/SB/08a. Applicant would respectfully request that the Examiner initial this form, where indicated, and return an acknowledgement copy to the applicant to confirm that the listed references were received and considered. The relevance of the references herein cited is described in the Background section of the originally filed application.

The person making this statement is the attorney who signs below on the basis of information supplied by the inventor and information in his files.

Respectfully submitted,



Charles D. McClung  
Reg. No. 26,568  
Attorney for Applicant  
Telephone: (503)227-5631

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on May 5, 2005.

Dated: May 5, 2005



Charles D. McClung

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**Substitute for form 1449A/PTO**

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## **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

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Sheet 1

of 13

**Attorney Docket Number**

CDM/2353.0010

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## U. S. PATENT DOCUMENTS

## FOREIGN PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>2</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)			

Examiner Signature		Date Considered	
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

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Attorney Docket Number

CDM/ 2353.0010

## Complete If Known

Application Number	10/507,387
Filing Date	09/10/04
First Named Inventor	Dipankar SEN
Art Unit	
Examiner Name	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Description of Non Patent Literature Document	
		Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. <sup>T<sup>2</sup></sup>	
		GIESE, BERND - Long-Distance Charge Transport in DNA The Hopping Mechanism - Acc. Chem. Res. 2000, 33, 631-636 - Department of Chemistry, University of Basel, St. Johanns-Ring 19, CH-4056 Basel, Switzerland	
		SCHUSTER, GARY B. - Long-Range Charge Transfer in DNA: Transient Structural Distortions Control the Distance Dependence - Acc. Chem. Res. 2000, 33, 253-260 - School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, Georgia 30332	
		KELLEY, SHANA O.; HOLMLIN, R. ERIK; STEMP, ERIC D.A. and BARTON, JACQUELINE K. - J. Am. Chem. Soc. 1997, 119, 9861-9870 - Beckman Institute, Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA 91125	
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		BOON, ELIZABETH M.; CERES, DONATO M.; DRUMMOND, THOMAS G.; HILL, MICHAEL G.; and BARTON, JACQUELINE K. - Mutation Detection by Electrocatalysis at DNA-Modified Electrodes - Division of Chemistry and Chemical Engineering, CA Inst. of Tech., Pasadena, CA 91125	
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				First Named Inventor	Dipankar SEN
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				Examiner Name	
Sheet	3	of	13	Attorney Docket Number	CDM/2353.0010

NON PATENT LITERATURE DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.				T <sup>2</sup>
		HALL, DANIEL B. and BARTON, JACQUELINE K. - Sensitivity of DNA-Mediated Electron Transfer to the Intervening -Stack: A Probe for the Integrity of the DNA Base Stack - J. Am. Chem. Soc. 1997, 119, 5045-5046 - Division of Chemistry and Chemical Engineering, California Inst. of Tech., Pasadena, CA 91125				
		RAJSKA, SCOTT R.; and BARTON, JACQUELINE K. - How Different DNA-Binding Proteins Affect Long-Range Oxidative Damage to DNA - Biochemistry 2001, 40, 5556-5564 - Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA 91125				
		GASPER, SUSAN M. and SCHUSTER, GARY B. - Intramolecular Photoinduced Electron Transfer to Anthraquinones Linked to Duplex DNA: The Effect of Gaps and Traps on Long-Range Radical Cation Migration J. Am. Chem. Soc. 1997, 119, 12762-12771 - School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, Georgia 30332				
		KAN, YONGZHI and SCHUSTER, GARY B. - Long-Range Guanine Damage in Single-Stranded DNA: Charge Transport Through a Duplex Bridge and in a Single-Stranded Overhang - Journal of the American Chemical Society - Volume 121, Number 47, December 1, 1999				
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		PORATH, DANNY; BEZRYADIN, ALEXEY; de VRIES, SIMON; and DEKKER, CEES - Direct Measurement of Electrical Transport Through DNA Molecules - <u>Letters to Nature</u> 2000 Macmillan Magazines Ltd. - Dept. of Applied Sciences, Delft University of Technology, 2628 CJ Delft, The Netherlands			
		FINK, HANS-WERNER and SCHOENBERGER, CHRISTIAN - Electrical Conduction Through DNA Molecules - <u>Letters to Nature</u> , 1999 Macmillan Magazines Ltd. - Institute of Physics, University of Basel, Klingelbergstrasse 82, CH-4056 Basel, Switzerland - Vol. 398, 04/01/99			
		OKAMURA, YOSHIO, et al. - Anisotropic Electric Conductivity in an Aligned DNA Cast Film - <u>Communications to the Editor</u> - J. Am. Chem. Soc. 1998, 120, 6165-6166 - 1998 American Chemical Society - Dept. of Biomolecular Engineering, Tokyo Inst. of Tech.			
		HALL, DANIEL B., et al. - Oxidative DNA Damage Through Long-Range Electron Transfer - <u>Letters to Nature</u> - Nature, Vol. 382, August 22, 1996 - Division of Chemistry and Chemical Engineering, CA. Inst. of Technology, Pasadena, CA 91125			
		NUNEZ, MEGAN E. - Long-Range Oxidative Damage to DNA: Effects of Distance and Sequence - <u>Research Paper</u> - Division of Chemistry and Chemical Eng., CA Inst. of			
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		(con't.) Technology, Pasadena, CA 91125				
		BIXON, M., et al. - Long-Range Charge Hopping in DNA - PNAS, October 12, 1999, Vol. 96, No. 21, pp. 11713-11716 - School of Chemistry, Tel Aviv Univ., Ramat Aviv, Tel Aviv 69978, Israel				
		SAITO, ISAO, et al. - Photoinduced DNA Cleavage Via Electron Transfer: Demonstration That Guanine Residues Located 5' to Guanine are the Most Electron-Donating Sites - J. Am. Chem. Soc. 1995, 117, 6406-6407				
		GOLD, LARRY, et al. - Diversity of Oligonucleotide Functions - Annu. Rev. Biochem. 1995. 64:763-97				
		HERMANN, THOMAS and PATEL, DINSHAW J. - Adaptive Recognition by Nucleic Acid Aptamers - <u>Science's Compass Review</u> - 02/04/00, Vol. 287, SCIENCE				
		RAJSKA, SCOTT R., et al. - Protein-Modulated DNA Electron Transfer - 1999 American Chemical Society				
		AICH, PALOK, et al. - M-DNA: A Complex Between Divalent Metal Ions and DNA Which Behaves as a Molecular Wire - J. Mol. Biol. (1999) 294, 477-485 - Article No. jmbi. 1999.3234				

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		PEATTIE, DEBRA A. - Direct Chemical Method for Sequencing RNA - Proc. Natl. Acad. Sci. USA, Vol. 76, No. 4, pp. 1760-1764, April 1979 - <u>Biochemistry</u> - Department of Biochemistry and Molecular Biology, Harvard University, Cambridge, Massachusetts 02138	
		WANG, WEI-KUNG, et al. - Molecular Biology of Human Immunodeficiency Virus Type 1 - Institute of Microbiology, College of Medicine, National Taiwan Univ.	
		PUGLISI, JOSEPH D. et al. - Conformation of the TAR RNA-Arginine Complex by NMR Spectroscopy - Science Vol. 257, July 3, 1992	
		BATTISTE, JOHN L. - Binding of an HIV Rev Peptide to Rev Responsive Element RNA Induces Formation of Purine-Purine Base Pairs - 1994 American Chemical Society - <u>Biochemistry</u>	
		ODOM, DUNCAN T. and BARTON, JACQUELINE K. - Long-Range Oxidative Damage in DNA/RNA Duplexes - <u>Biochemistry</u> 2001, 40, 8727-8737 - American Chem. Soc.	
		LILLEY, DAVID M. J. - All Change at Holliday Junction - Proc. Natl. Acad. Sci. USA, Vol. 94, pp. 9513-9515, September 1997	

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		HUIZENGA, DAVID E., et al. - A DNA Aptamer That Binds Adenosine and ATP - Biochemistry 1995, 34, 656-665 - 1995 American Chemical Society	
		LIN, CHIN H. and PATEL, DINSHAW J. - Structural Basis of DNA Folding and Recognition in an AMP-DNA Aptamer Complex: Distinct Architectures But Common Recognition Motifs for DNA and RNA Aptamers	
		Complexed to AMP - Cellular Biochemistry and Biophysics Program, Memorial Sloan-Kettering Cancer Center, New York, NY 10021	
		ODOM, DUNCAN T., et al. - Robert Charge Transport in DNA Double Crossover Assemblies - Research Paper - Chemistry & Biology 2000, 7:475-481 - Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA 91125	
		TELSER, JOSHUA - DNA Duplexes Covalently Labeled at Two Sites: Synthesis and Characterization by Steady-State and Time-Resolved Optical Spectroscopies - J. Am. Chem. Soc. 1989, 111, 7226-7232 - 1989 American Chemical Society	

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		Author Unknown - Amine-Reactive Probes -				
		Molecular Probes - Product Information - Revised: 12/08/03				
		HALL, DANIEL B., et al. - Oxidative DNA Damage Through Long-Range Electron				
		Transfer - Letters to Nature - Nature, Vol. 382, 08/22/96 - Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA 91125				
		NUNEZ, MEGAN E; HALL, DANIEL B.; and BARTON, JACQUELINE K. - Long-Range Oxidative Damage to DNA: Effects of Distance and Sequence - Research Paper, Chemistry & Biology, February 1999, 6:85-97				

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		GRINSTAFF, MARK W. - How Do Charges Travel Through DNA? - An Update on a Current Debate - Highlights, Angew. Chem. Int. Ed. 1999, 38, No. 24 - WILEY-VCH Verlag GmbH, D-69451 Weinheim, 1999		
		SAITO, ISAO - Mapping of the Hot Spots for DNA Damage by One-Electron Oxidation: Efficacy of GG Doublets and GGG Triplets as a Trap in Long-Range Hole Migration - J. Am. Chem. Soc. 1998, 120, 12686-12687 - 1998 American Chemical Society		

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Application Number	10/507,387
Filing Date	09/10/04
First Named Inventor	Dipankar SEN
Art Unit	

Examiner Name

CDM/2353.0010

## NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		WELLINGER, R. J. and SEN, D. - <i>The DNA Structures at the Ends of Eukaryotic Chromosomes</i> - European Journal of Cancer, Vol. 33, No. 5, pp. 735-749, 1997	
		SIMONSSON, TOMAS - <i>G-QUADRUPLEX DNA STRUCTURES - VARIATIONS ON A THEME</i> - Biol. Chem., Vol. 382, pp. 621-628, April 2001, Medical Research Council, Laboratory of Molecular Biology, Hills Road, Cambridge CB2 2QH, UK	
		GIESE, BERND, et al. - <i>Direct Observation of Hole Transfer Through DNA By Hopping Between Adenine Bases and By Tunnelling</i> - Letters to Nature, Nature, Vol. 412, July 19, 2001 Macmillan Magazines Ltd.	

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		NAKATANI, KAXUHIKO, et al. - N2- <i>Phenyldeoxyguanosine: Modulation of the Chemical Properties of Deoxyguanosine toward One-Electron Oxidation in DNA</i> - J. Am. Chem. Soc. 2002, 124, 6802-6803 -	
		Department of Synthetic Chemistry and Biological Chemistry, Faculty of Engineering, Kyoto University	
		SAITO, ISAO, et al. - <i>Photoinduced DNA Cleavage via Electron Transfer: Demonstration That Guanine Residues Located 5' to Guanine Are the Most Electron-Donating Sites</i> - J. Am. Chem. Soc. 1995, 117, 6406-6407 - 1995 American Chemical Society	

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		SZALAI, VERONIKA A. and THORP, H. HOLDEN <i>Electron Transfer in Tetrad: Adjacent Guanines Are Not Hole Traps in G. Quartets</i> - 2000 American Chemical Society - Dept. of Chemistry, Univ. of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3290
		WANG, YONG, et al. - <i>RNA Molecules That Specifically and Stoichiometrically Bind Aminoglycoside Antibiotics with High Affinities</i> - <i>Biochemistry</i> 1996, 35, 12338-12346, 1996 American Chemical Society - Dept. of Biological Chemistry and Molecular Pharmacology, Harvard Medical School, 250 Longwood Avenue, Boston, Massachusetts 02115
		MAO, CHENGDE, et al. - <i>A Nanomechanical Device Based on the B-Z Transition of DNA</i> - <i>Letters to Nature</i> , Nature, Vol. 397, January 14, 1999 - 1999 Macmillan Magazines Ltd.

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				<i>Art Unit</i>	
				<i>Examiner Name</i>	
Sheet	13	of	13	<i>Attorney Docket Number</i>	CDM/2353.0010

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